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ABSTRACT

This trainer's guide is intended to assist supervisors of work-based career training projects in teaching students to compare the performance of two different types of engineering cutting tools and to determine their cost-effectiveness and efficiency. The guide is one in a series of core curriculum modules that is intended for use in combination on- and off-the-job programs to familiarize youth with the skills, knowledge, and attitudes necessary for success in the workplace. Included in the guide are the following components: project information, a summary of the content and approach of the guide, supervisor's notes, background information, lists of tasks and core skills, an action plan that includes suggested learning activities, supervisor and trainee review sheets, and an assessment form. (YLB)

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ED265338

Youth Training Scheme

CORE EXEMPLAR WORK BASED PROJECT

Cutting tools

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ESF
CORE SKILLS PROJECT
YTS

OTF No: 6

PROJECT No: M|44

TYPE Individual

2

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ASSESSMENT OF CORE SKILLS

This series of projects contains a number of different formats for recording assessment of core skills. These formats are offered for experimental purposes; none is proven as the 'best' method. All are based on the principle that feedback to trainees is a necessary part of the learning process and that such feedback should include information on core skill development.

Further work is being carried out on the methods of assessing achievement of core skills in work-based learning and of how to log such achievement on a record which trainees can take away from YTS. Some of the results of this work will be included in later MSC/ESF Core Skills Project publications.

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INTRODUCTION

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WHAT ARE WORK-BASED PROJECTS?

Work-based projects are learning materials which aim to make the most of all the possibilities for developing trainees' skills, knowledge and attitudes in the workplace. They build upon everyday workplace tasks to provide experience of the whole range of YTS learning opportunities.

The projects in this series have been tested with managing agents as part of the YTS Core Project, which is jointly financed by MSC and the European Social Fund. In some cases managing agents will be able to use the projects as they are. In others they will need to be adapted to the circumstances of a particular workplace or to the aims of a particular scheme. Some managing agents will prefer to produce their own projects. For such cases these examples aim to demonstrate some principles of good design in work-based learning materials. These principles are:

To encourage trainees to learn by doing
To make the most of all the experiences which are available to trainees in the workplaces.
To start from a real task which is seen as relevant by all parties involved — trainees, workplace supervisors, trainers and off-the-job tutors.
To help trainees see the relationships between things learnt on- and off-the-job.
To base the assessment of achievement upon trainees' actual performance in tasks.
To look for all the opportunities for learning which arise from a task and, in particular, to help trainees to develop the core skills. These skills, in number, communication, problem-solving and practical activities, are used in a wide variety of tasks and are essential if trainees are to achieve competence in those tasks*. They are the skills — of finding out information, planning how to do things, overcoming difficulties and so on — which help trainees to learn more quickly in new situations, either in the same workplace, in a different one, or in the world outside work.

Such skills are required naturally by the workplace tasks in these projects and, in requiring trainees to go beyond the task itself, the projects deliberately *add* to the range of core skills which are required in an everyday working situation. This is especially important for some of the skills of communication and problem-solving which trainees are often not given the opportunity to exercise in work experience.

These principles can be incorporated in projects for all placements and for trainees of all ability levels. Although the projects in this series follow a common format, there is no single 'best' style. Nor is any special expertise in writing necessary. Good work-based projects can be produced by anyone who is determined to help trainees to exploit all of the potential for learning in work experience.

*A technical manual 'Core Skills in YTS' is currently available from MSC. It is supported by a short introductory leaflet and a practitioner's guide for supervisors. A separate manual is available on computer literacy/information technology.

PROJECT INFORMATION

This project was developed at AUSTIN ROVER (DREWS LANE PLANT), to encourage the development of CORE SKILLS in trainees, particularly those of communication, considered by the supervisors at AUSTIN to be a general weakness in young engineers. It also gives craft trainees the opportunity to start to develop technician type skills.

It has been tested by two trainees who had been on the scheme for approximately six months. The manufacture of the shear pins caused the trainees no real problems, and any simple component would have been equally appropriate. However, the project is not about how shear pins are manufactured but about comparing and contrasting the performance of the cutting tools used in the manufacturing process.

The trainee is, therefore, required to plan how to carry out an investigation and how to record results; to find out additional information about tool performance, and to present the findings of the investigation to management.

The trainees produced a very detailed report which impressed supervisors and managers alike.

The project could be easily modified for any situation where trainees could compare the performance of different types of tools, equipment or machinery and could be completed either in the training workshop or as an on-the-job training exercise.

While this project centres around an essentially practical activity (machining a number of components correctly), the PRACTICAL CORE SKILLS have been deliberately omitted from the skills identified for assessment via the project, so as to focus attention on the other CORE SKILLS being developed through planning, evaluating, and reporting on the results of that activity.

SUMMARY

The project asks the trainee to compare and contrast the performance of two different types of engineering cutting tool and to come to some conclusions as to their cost effectiveness and efficiency.

SUPERVISOR'S NOTES

INTRODUCTION

This work based project is designed to focus the trainee upon the CORE SKILL areas of: number; communication; practical skills, and problem-solving. Wherever possible, it is also designed to provide learning opportunities to improve personal effectiveness; to provide wider knowledge of the world of work and elsewhere; and to furnish the trainee with skills which can be transferred to other situations.

The essence of the work based project is that people learn more quickly and effectively by actually doing something.

The following notes are designed to help you, your staff, and the trainee, so that the project can be carried out with a minimum of disruption to normal work activity.

1. Where relevant, please advise other staff that the trainee will be doing the project;

2. Please ensure that the trainee has read the project details and understands what is required;

3. Please ensure that the trainee is aware of any aspects of safety, hygiene or security which might touch upon the project;

4. Please ensure that the trainee appreciates that good planning will make the task easier. Wherever possible, and before the project starts, the trainee should be encouraged to take responsibility for his/her learning by estimating time, deciding on equipment and materials, identifying possible hazards and other problems, and generally "thinking the project through".

5. Upon completion of the project discuss with the trainee the activities he/she has been engaged in. What problems were there? What has he/she learnt? Would he/she tackle the project differently?

Encourage the trainee to complete the trainee's comments page.

Names

TRAINEE .....

SUPERVISOR .....

TUTOR .....

Times

Please fill in the table below. This will show the time you spend on completing this project. The first column has been filled in as an example. Make another table if you need more space.

DATE				
START				
FINISH				
TIME SPENT (HOURS)				

BACKGROUND

New technology should be an asset to engineering. But is it? This project gives you the opportunity to draw your conclusions from comparing, under test conditions, the efficiency of high speed steel tips and indexable insert cutting tools.

SITUATION

ANY ENGINEERING COMPANY.

PURPOSES

This project gives you the opportunity to organise the testing of different types of cutting tool, to compare and contrast their performance, and to make recommendations on their cost effectiveness.

Doing this project will enable you to learn more about the engineering industry. It will also help you to develop your CORE SKILLS (number, communication, problem-solving, and practical skills). Increasing your abilities in these skills will make it easier for you to change jobs and retrain when the need arises.

The tasks you are asked to do are outlined below, together with the most important CORE SKILLS that they contain. When you have finished each task, ask your supervisor to tell you how well she/he thought you did in the task, and record this on the Assessment Form near the back of this Project. This record will be needed to complete your Certificate at the end of your YTS year.

WBP TASK	ACTIVITY	CORE SKILL
1.	Find out information on cutting tools by talking to your supervisor and the storekeeper	Find out information by speaking to other people 6.1
2.	Plan out the way in which you are going to carry out the experiment.	Plan the order or activities 9.1
3.	Plan how to record data during the test run.	Plan how to present information. 9.6
4.	Plan the correct sequence of action needed to correctly manufacture the component specified.	Plan the order of activities. 9.1 Interpret diagrams and pictorial representaction. 2.2
	Work out the correct speeds and feeds etc. as specified on the drawing.	Work out numerical information. 1.2
	Monitor the performance of the cutting tools.	Monitor a process or activity. 11.2

6.	Analyse your findings so that you can compare the performance of each cutting tool tested.	Interpret numerical data or symbols in written or printed form. 2.1 Compare the relative cost and benefits of buying or using goods or services. 5.2
7.	Present findings in a short report to your supervisor. Write a letter to suppliers.	Provide information in writing and by means of tables and diagrams 7.3
8 & 9	Make a presentation of your findings to the Toolroom Manager or Product and Production Engineer.	Plan how to present information. 9.6 Provide information by speaking to other people in the work-place. 7.1

Each CORE SKILL is identified by number in the PRACTITIONER'S GUIDE to the YTS CORE, which contains advice and guidance on what CORE SKILLS are and their uses. The numbers are included here for ease of reference.

ACTION PLAN

TASK 1

Find out as much as you can about high speed steel tools and indexable inserts.

Talk to your supervisor and arrange a visit to the stores to find out information from the storekeeper.

Plan the questions you want to ask before you go to the stores. Make notes on the information you find out.

TASK 2

Think about how you are going to conduct your experiment. Plan the order or sequence of activities. Make a note of the order you intend to follow and any points you should check at each stage.

Discuss this with your supervisor.

TASK 3

You must now plan how you are going to record information during the test run.

Design a data recording sheet which will help you to collect and report on the results you have found. The following is only a start, so think about other things that should be recorded and other headings that you will need.

HIGH SPEED STEEL	INDEXABLE INSERTS
REGRIND	RESET
TOOL WEAR	TOOL WEAR
SURFACE FINISH	SURFACE FINISH

Show the record sheet to your supervisor and make sure that it covers all aspects of cutting tool performance. Remember, it is essential in any experiment to ensure that you record all data accurately and carefully.

TASK 4

Study the attached drawing (Appendix One) and plan out the correct sequence of action to manufacture the component. Record this information and note any points to be checked at each stage.

Work out the correct speeds, feeds and depth of cut for the materials to be used. Record these figures and check your accuracy with your supervisor.

TASK 5

Now you are ready to carry out your test run. Select the tools and materials you will need to carry out the manufacturing operation. The test on each tool is to be of six hours duration. Estimate how many components you would expect to make in six hours and record this on your record sheet. The recording of time during this experiment is going to be very important. Make sure that you are able to record time accurately, especially the time taken to reset or regrind tools.

TASK 6

Carry out the correct start up procedure and ensure that you have carried out all health and safety checks.

Manufacture the components according to the dimensions and finish specified on the drawing. Make necessary adjustments to the lathe and pay due attention to the finish and accuracy of the component.

Using your recording sheet note carefully all your findings during the test run. Record in such a way that you can easily compare tool performance. Be prepared for the unexpected and make any special notes that you think are necessary.

You will need to monitor this activity very carefully so that you do not miss any information.

TASK 7

At the end of the test run analyse your findings. You will need to interpret the information you have collected so that you are able to compare the performance of each tool. Come to some definite conclusions especially about efficiency of performance and cost effectiveness. To do this you will need additional information on the cost of high speed steel tips and indexable inserts. Discuss with your supervisor how you can find out this information.

TASK 8

Now comes the difficult bit!

The information you have collected will give your supervisor valuable information on tool performance. Present your findings in the form of a short report to your supervisor. Be prepared to ask and answer questions.

TASK 9

Write a letter to the tool suppliers describing the results gained from your experiment and ask them to send to you additional information on the tools you have tested. When the information arrives look through it carefully. Are there any other advantages to be gained from using indexable inserts or high speed steel tips that were not drawn out by your experiment? Make a note of these to include in your final report.

TASK 10

In completing this investigation you may have gathered important evidence on the efficiency of the cutting tools used by the company. Write up the details of your investigation as a final report to the Company.

Make an appointment to present your findings to either the Product and Production Engineer or Toolroom Manager. Think about the best way of doing this and discuss it with your supervisor. Before the appointment work out carefully what you want to say and the questions you might ask. Use the meeting to compare your results with the company's experience.

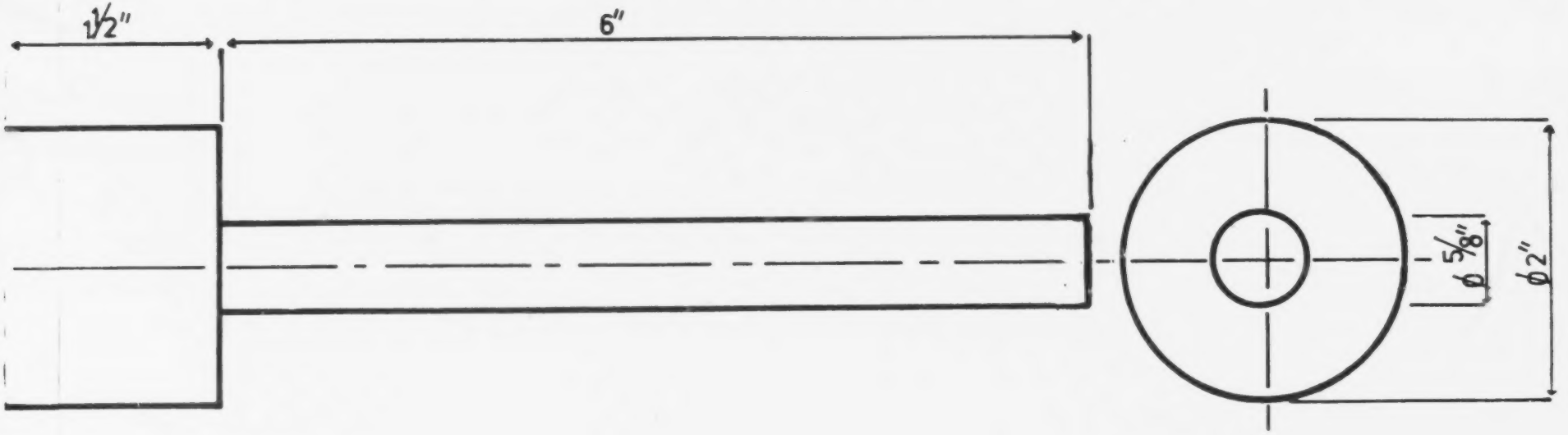
Remember Product and Production Engineers and Toolroom Managers are busy people so be punctual and polite.

TASK 11

Discuss the outcome of the meeting with your supervisor. Think about the test as a whole. Is there anything that you might have done differently? How does your supervisor think you have done? Make a note at the end of your project report of any modifications to your experiment that you think might be needed if you were asked to carry out a similar investigation.

Discuss with your off job tutor or instructor about arranging a time to give a presentation of the findings from your experiment to the rest of the trainees in your group.

Think carefully about how you might present your information and talk it through with your instructor/tutor/supervisor beforehand.



MATERIAL: BDMS

SURFACE FINISH: 1·6 ℄ AVERAGE

TOLERANCE ZONE: ± ·010″

APPENDIX ONE

SHEAR PIN

TRAINEE REVIEW

PLEASE COMPLETE THIS FORM IN AS MUCH DETAIL AS POSSIBLE AND DISCUSS IT WITH YOUR SUPERVISOR AND TUTOR.

1. Were you offered a selection of Projects to choose from? If so, why did you choose this one?

2. What did you think of it? Was it - easy, hard, interesting or boring?

3. What did you learn? (Look at the list of Purposes).

4. Did you learn something which was not on the list of Purposes?

5. Did you need help with any particular part of the Project? What kind of help did you get?

6. Were there any words in the Project that you did not understand? Please list them.

7. Do you think you could use what you learned in another job, or outside work?

8. Has this Project helped you decide whether you need further training in certain areas?

SUPERVISOR REVIEW

Please refer to Supervisor's Notes.

Please read the questions included under Trainee Review.

Please complete the Assessment Form and discuss your assessment with the trainee before initialling it to show that you both agree with the assessment.

COMMENTS:

ASSESSMENT

explanatory notes

In completing this wbp the trainee has the opportunity to demonstrate competence in the CORE SKILLS listed on the attached form.

The first two columns list the wbp Tasks and the CORE SKILLS which occur within them.

You are asked to assess the trainee's competence in these CORE SKILLS according to the amount of support from you that the trainee needed, for example:-

1) if a trainee is asked to "find information from written sources" and you provide the trainee with all the sources of that information, together with telling the trainee where to look in any particular source, then that trainee is obviously being given much more support in finding that information than a trainee who identifies the sources and extracts correct information unaided;

2) if a trainee is asked to undertake a task which involves "noticing the needs of customers or clients", and needs considerable prompting to approach a customer, then that trainee is obviously being given more support than a trainee who takes the initiative in approaching the customer.

To be regarded as fully competent in the CORE SKILLS, the trainee should need to be offered no more support than you would normally give to any experienced worker.

Most of the time job competence and CORE SKILLS competence are likely to be the same, but sometimes this may not be so. For instance, a trainee involved in machining a particular component may be competent so far as planning the work is concerned (a CORE SKILL), but may not have reached experienced worker speeds (an occupational skill).

Please tick the appropriate box and initial in the space provided, after you have discussed your assessment with the trainee and agreed any further training required.

ASSESSMENT FORM

PROJECT TITLE CUTTING TOOLS WBP NO M/05/005 DATE

TRAINEE'S NAME SUPERVISOR'S NAME

WBP TASK NO	CORE SKILLS ASSESSED	NEEDED A LOT OF ASSISTANCE	NEEDED SOME ASSISTANCE	LITTLE OR NO ASSISTANCE		COMMENTS INCLUDING NO OPPORTUNITY	AGREED INITIALS	
				NEEDS MORE PRACTICE	COMPETENT		TRAINEE	SUPERVISOR
1	6.1 Find out information by speaking to other people.							
2 & 4	9.1 Plan the order of activities.							
3 &10	9.6 Plan how to present information.							
4	2.2 Interpret diagrams and pictorial representations.							
4	1.2 Work out numerical information.							
6	11.2 Monitor a process or activity.							
7	2.1 Interpret numerical data or symbols in written or printed form.							
7	5.2 Compare the relative costs and benefits of buying or using goods and services.							

ASSESSMENT FORM
continued.

WBP TASK NO	CORE SKILLS ASSESSED	NEEDED A LOT OF ASSISTANCE	NEEDED SOME ASSISTANCE	LITTLE OR NO ASSISTANCE		COMMENTS INCLUDING NO OPPORTUNITY	AGREED INITIALS	
				NEEDS MORE PRACTICE	COMPETENT		TRAINEE	SUPERVISOR
8 & 9	7.3 Provide information by speaking to other people in the workplace.							